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## The Field of Race-Psychology

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It is a common belief that races differ from one another in their mental traits as much in their physical appearance and social customs. The cultural diversity is attributed in popular thought more often to mental differences than to other causes. Students of primitive life, like Tylor and Frazer, have attempted to explain animistic beliefs and customs in terms of certain types of thoughts peculiar to undeveloped races. Durkheim and Levy-Brühl, in the same manner have tried to define the nature of the processes characteristic of the primitive mind. The tendency has had its echo in the philosophic thought of the day. Thus, H. S. Chamberlain and his followers have enunciated a philosophy of race-romanticism upon the assumption of a superior psychic endowment of the nordic races. Among the psychologists, the theory of specific psychic gift of races and of the possibility of their mental gradation, has found a champion in no less a person than Professor MacDougall who seems to support the nordic theory. Side by side with these theories and speculations, a number of workers have been carrying on experimental investigations on the question of psychic difference of races for many years. The data of these studies form an important part of the current literature of psychology. The study of mental life of racial groups has, thus, reached a

stage when it can legitimately claim the special attention of psychologists. Time is ripe, therefore, for defining the field and methods of Race-Psychology.

The term 'Race' has been employed by psychologists largely in its physical connotation. It is a group the members of which possess a high degree of anatomical resemblance. The psychological investigation has, for this reason, been mainly confined to the primitive races whose racial heritage is unmistakable. It is on this assumption that comparison has been instituted between the 'full-blooded' and 'mixed' races, and between 'Blacks,' 'Browns' and 'Whites.' Race-Psychology therefore does not concern itself with the psychology of social and cultural groups in general, nor with political groups, unless they are identical with race-groups.

The first task of Race-Psychology is to ascertain the nature of the mental states which may be regarded as the common possession of the race. The mental state of the individual is discovered from introspective reports and ~~inferred from~~ behaviour. The same methods have been pursued in all popular disquisitions on racial mind. It is a common pastime of literary-minded travellers to write about the mentality of people with whom they come into contact. The writers rely solely upon the impressions which they gather from personal contact with a few individuals whom they regard as a fair sample of the race. Ideas and feelings of a selected number of persons and their behaviour interpreted in the light of the preconceived notions of the writer, serve as the basis of a theory of racial mentality. Such a method appears on the surface as a truly psychological procedure, in which the writer plays the part of the experimenter of psychological experiments. The generalisation, too, resembles a proper scientific induction. The drawback lies in the fact that the group of individuals studied is rarely a fair sample of the race. Further, the ideas and feelings which the people express, are very often dictated by a desire to 'pose' and to

tell a good story. The student of races is thus easily duped, as he is seldom able to go behind the apparent meanings. In addition to these, he has a source of error in his preconceived notions, which, in the absence of any recognised standard, serve the purpose of interpretation. Most of the studies in racial psychology, therefore, turn out to be mere causeries and interesting snapshots, the value of which depends upon the literary ability of the author.

A second line of approach lies in drawing inferences from the social institutions such as language, forms of marriage, social customs, as also from the ideology of religion and other culture-systems. Most of the views of racial character are based upon the data of this category. This method of understanding the mind of a race is riddled with the difficulties which beset the previous procedure. The psychological picture which it yields reflects in a large measure, the preconceived ideas and is coloured by the sentiments and subjective attitudes of the author. Moreover, the institutions in question are shaped by a historical process and depend upon a number of variable factors. A custom may persist in spite of inner protest by those who obey it; it may be tolerated in indifference; or it may possess widely different significance for different groups of population. To infer mental states as correlates of a culture-product is, therefore, a hazardous task.

Another method takes for its data the statistical figures for human events such as suicides and divorces, marriages and crimes, and attempts to base an account of racial mind upon these phenomena. While the facts are undoubtedly significant and relevant, to weave them into a psychological description involves an act of interpretation. Thus the apparent objectivity of facts disguises the large mass of preconceived notions which cement them into unity and translate the figures into mental states. It must be admitted, however, that social statistics supplies valuable materials for the

reconstruction of the race-mind, provided that the pitfalls of interpretation are duly recognised.

Lastly, there remains the method of mental testing. General intelligence tests, as also those for special capacities are being applied to racial groups for rating the status of mind. It is obvious that the data thus obtained give us a scale in which a group may be placed in relation to other groups. It is also clear that the scale in question can have reference only to a particular mental capacity, like visual acuity or color-discrimination. It is impossible to form any absolute estimate of particular groups; each race must be judged in relation to others with respect to the capacity in question. It is equally difficult to form an idea of the general mental ability of a group. For, mind, character and general ability would appear to be a mosaic of special aptitudes.

The data discovered by these methods do not belong to the same category. The insight obtained by personal contact with the members of a group can only be formulated in certain descriptive terms which express an estimation and value of character. Racial groups have sometimes been described as crafty and dishonest, as enterprising or servile. These terms do not portray the mental life of the groups in question; they represent the attitude of the observer and his scheme of social values. The psychological interpretation of institutions on the other hand reveals the relatively fixed modes of behaviour which may or may not be accompanied by the corresponding states of thought and feeling. The custom of animal sacrifice which is to be found in many types of religion, is not necessarily accompanied by a conscious lust for blood nor does it imply the existence of a murderous nature. Tradition dies hard and often outlives the need which brings it into existence. Thirdly, the data of social statistics lead us to unconscious drives whose uniform operation in a group may be due either to organic factors or to the conditions of

the environment. As a matter of fact they may be accompanied by mental states of very different character. For instance, each suicide has its special colouring of emotions and ideas; each divorce has its particular reason. Lastly, the method of mental testing reveals the basic psycho-physical capacities which may operate in different situations and upon a variety of materials. The test of attention, for instance, may bring out its duration or range; the test of rote-memory would exhibit the perseverative tendency of impressions. The attentional process of different groups of people however may be directed to different objects; memory may be concerned with a variety of materials. Yet the basic capacity may be adjudged to be greater in one case than in another. Each method of enquiry, therefore, leads us to a particular aspect of mind which may vary independently of other aspects so far as our present state of knowledge is concerned.

No single method of approach, nor all of them taken together therefore, would lead us to a simple judgment, good or bad, superior or inferior, in regard to the mental life of a racial group. For instance, Darsie finds that "Japanese children impress teachers as being less self-confident, free from vanity, and more sensitive to approval than American children, as well as more stable emotionally and more responsive to beauty."<sup>1</sup> The mental life of the group in question is, thus, made up of a number of capacities which vary independently. A race may manifest a striking ability in one direction and may be backward in others. The materials with which Race-Psychology has to deal must, then, be regarded as being heterogeneous in character. The laws and determinants of each set of mental facts should, therefore, be considered independently.

<sup>1</sup> Darsie—Mental capacity of American born Japanese children, *Com. Psych. Monograph*, 1926, 16, also *Psychological Abstracts*, Vol. I, No. 1, p. 35.

Yet it is by no means suggested that the task of race-psychology is to venture on a series of unconnected speculations regarding the causation of different sets of psychological events. In the field of individual psychology a mental state or behaviour is said to be explained when it can be traced to a number of facts which may be termed *determinants* of mind. These facts may be divided into four classes. (1) The past history of the individual, some parts of which may figure in his memory, shapes the course of consciousness and behaviour. It is a matter of common observation and has been verified by the data of abnormal psychology. (2) The physical constitution of the individual, determined partly by heredity and partly by the environment, constitutes another factor which undoubtedly influences the general configuration as well as the growth and decay of mental and motor capacities. (3) The physical environment likewise determines the character of mind in as much as it demands adaptation. (4) The social environment is a determinant in the same way; it stimulates not only a conscious adjustment but also an unconscious modification of behaviour, as psycho-analytic studies amply prove. The task of individual psychology is to correlate mental states and behaviour of the individual with one or more of these determinants. The problem of race-psychology has to be defined in the same manner.

The past history of the individual influences the course of his mind partly through attitude unconsciously induced and partly through the mediation of conscious memory. The race-group likewise determines the mental life or its descendants through traditions, which are imbibed unconsciously, and through the ideology of traditions which is handed down from generation to generation. Myths and maxims play the same part as memories in individual life.

In regard to the influence of the racial physique upon the racial mind, the evidence is somewhat conflicting. It has been asserted that the cranial capacity of races does

not bear any significant correlation with the mental states.<sup>1</sup> At the same time, the studies of Garth and Murdoch indicate that the physical factor has a great deal of influence upon the race-mentality.<sup>2</sup> Thus, colour preference seems to run on racial lines.<sup>3</sup> It has also been found that the eye of the Melanasian adjusts itself to the dark more quickly than that of the European. Guppy believed that this was due to the larger size of the pupil in the dark races. But the more reasonable hypothesis seems to be that the eye shares in a larger amount of pigments in the dark races and thus the visual purple may be formed more readily and rapidly.<sup>4</sup> In the same manner, the full-blood Indians, mixed Indians, and Whites have been found to differ with respect to their susceptibility to mental fatigue.<sup>5</sup> The difference with respect to abstract intelligence also run on racial lines.<sup>6</sup> If 'race' is to be regarded as an anatomical concept, it stands to reason that the peculiarities of bodily organisation would have their echo in the sphere of mind.

In the third place social environment influences the race-mentality through institutions and occupations and general modes of life. Thus a special mental attitude develops in militaristic societies and in the soldiery of all races. The soldier, it is said, is made irresponsible in as much as no exercise of thought and will is required in the rank and file. His self-expression takes two forms, gambling and search for women. The feeling of boredom in times of peace and that of unusual excitement in the time of war release the primal drives from all social and moral restraints. Thus soldiers are

<sup>1</sup> Boas—*Mind of the Primitive Man*, also Guha—*Brain Capacity and Intelligence*, I. J. P., Vol. I, No. 1.

<sup>2</sup> Garth - *Race and Psychology*, *Scient. Mo.* 1926, 23.

Murdoch—*Indus. Psycho*, 1926, 1, also *Psychological Abstracts*, Vol. I, No. 1, pp. 36, 38.

<sup>3</sup> Colour preference of five hundred full-blood Indians, *J. L. of Exp. Psy.*, 1920, also *Psychological Abstracts*, Vol. I, No. 2, p. 21.

<sup>4</sup> *Cambridge Expedition to the Torres Straits*, Vol. II, Part I, p. 40.

<sup>5</sup> Garth—*Journal of Applied Psychology*, Dec., 1923.

<sup>6</sup> Garth—*Scient. Mo.* 1926, No. 23.

apt to speak of women as they do of food, drink and other animal necessities.<sup>1</sup> The occupation of hunting develops in the same way a peculiar form of religious belief and feeling. There arises a strong sense of dependence upon nature and upon a mysterious external power. The hunter, thus, "is a kind of pantheist or hekatotheist who sees behind the outward appearance of things a vague undifferentiated supernatural power which shows itself alike in beast and plant, in storm and thunder, in rock and tree, in the magic of the Shaman and in the spirits of the dead."<sup>2</sup> Culture and morals as well as religious beliefs and feelings are, therefore, dependent upon the operation of the social environment.

Lastly, the physical environment in which a race-group lives, has a determining influence upon the sensory powers and other psycho-physical capacities. The ability of primitive peoples to recognise and to describe distant objects is much greater than that of civilised races. Birds in the shady foliage can be readily perceived, and certain Indian tribes can tell the sex of the deer at a great distance. These powers are said to be due to practice in the adjustment of accommodation for distant objects which life in the particular environment demands.<sup>3</sup> The backwardness of intellect as also small power of aesthetic appreciation of nature so frequently found in primitive people, are accounted for by the fact that there is a greater need for attention to physical objects and phenomena. It is said that "if too much energy is expended on the sensory foundations, it is natural that the intellectual superstructure should suffer. It seems possible also that the over-development of the sensory side of mental life may help to account for another characteristic of the savage mind. There is little doubt that the uncivilised man does not take the same aesthetic interest in nature which is found among civilised

<sup>1</sup> Williams—Principles of Social Psychology, pp. 392-400.

<sup>2</sup> Sociological Review, Vol. XVII, p. 109.

<sup>3</sup> Cambridge Expedition to Torres Straits, Vol. II, Part I, p. 43.



peoples. Naturally a great lover of scenery, Ranke, found, after living in south America, learning to see things as natives saw them, that he had lost his capacity for aesthetic enjoyment of the scenery as a whole. He also found that owing to the fact that he was continually attending to details, he was unable to devote attention to the more serious problems of life."<sup>1</sup> The course of mental life can, therefore, be explained in terms of the insistent demand which the physical environment makes upon the individual to attend to details.

The race mind as a mosaic of capacities and dispositions, of mental states and primal drives, discovered by the different methods of investigation, is then the basic fact which Race-Psychology is called upon to explain. The causal factors are to be found in the past history and traditions, in the bodily constitution of the race, in the social forms and culture-products, and in the physical environment in which it is the destiny of a people to live. It is no part of the task of the psychologist to explain institutions and racial achievements in terms of psychic endowment. That is a field which must be left to the anthropologist. For, the basic facts with which the anthropologist is concerned, are social forms, the culture-products and such other objective phenomena. It is his task to trace the causal nexus of these facts to a series of subjective and objective events. Past history, the geographical environment as well as innate mental abilities have been regarded as determinants of racial life in its various aspects. The psychologist, therefore, begins with subjective processes and seeks their explanation in the racial history, racial physique, and environment : the anthropologist starts with objective facts of institutions and culture-products and traces them to historical contacts and to modes of physical and mental adjustments to nature and to social surroundings.

Psychology is said to have a long past but a short history. The statement is particularly applicable to Race-Psychology.

<sup>1</sup> *Op. Cit.*, p. 45.

Ever since human groups met one another in alliance and enmity, each race has attempted to take stock not only of the arms and man power of others but also of their habits and ways of thinking. The past of Race-Psychology must, thus, be followed back to ages long forgotten. Its history, however, begins with the study of culture-systems and institutions. It is the student of social origins who first attempted to understand the character of mental states which lie at the basis of social formations. The psychologist has appeared on the scene very late in the day and has attempted to give a realistic and scientific turn to the speculative procedure hitherto in vogue. But the methods of investigation have to be developed; explanatory hypotheses have yet to be weighed in the balance. The margin of error is so large that even when methods and principles have been rigorously checked, the explanation of the mental life of racial groups would still appear largely as a speculative endeavour. It is, however, apparent, as the results of psycho-physical tests show, that much can be done by way of collecting a mass of well-attested data with respect to different psychic states. Whatever the value of explanatory hypotheses may be, the importance of facts which can be collected in this way, is unquestionable both for race-psychology and for individual psychology.

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## "The Sign Language of Deaf-Mutes"

H. C. BANERJEE

### I. *Introduction.*

The sign language of the deaf mutes is learnt imitatively through vision in the environment of the institution. It is a language which has grown up, from what origin we know not, inside the Deaf and Dumb School. It is one of the youngest languages in the world being no older than the institution itself, some twenty to fifty years in the case of those in Bengal, whereas the speech of man dates from the beginning of history. Thus we study here the birth of a language.

Man's earliest efforts at self-expression probably took the form of a mixture of gestures and cries. His urgent need of his own hands gave an advantage to cries for he could so talk and act simultaneously. The relics of the gesture language still survive, in the head shake for 'No,' the shrug of the shoulders for 'Don't care,' and in the finger and Thumb gesture which is used by Bengalis to denote 'a little,' and in many other commonly understood gesture symbols. The gesture language of primitive man never reached the variety and expressiveness of the modern gesture language of deaf mutes; for before his thought-processes ever reached such complexity, he had definitely cast his vote for a language of cries and sounds. In the gesture language of deaf mutes we see the higher stages of gesture speech which man might have attained had he made the other choice, and preferred to speak with his hands instead of with his mouth.

The following quotation from Dr. Gallaudet will indicate the extent to which this silent language is capable of developing: ("The Deaf and their Possibilities.")

“On occasions, almost without number, it has been my privilege to interpret through signs to the Deaf, addresses given in Speech; I have addressed hundreds of assemblages of Deaf persons in the College, in schools I have visited and elsewhere, using signs for the original expression of thought; I have seen many more lectures and public debates given originally in signs; I have seen conventions of deaf-mutes in which no word was spoken, and yet all the forms of Parliamentary proceedings were observed, and the most earnest and even excited discussions were carried on. I have seen the ordinances of religion administered and the full service of the church rendered in signs; and all this with the assurance growing out of my complete understanding of the language—a knowledge which dates from my earliest childhood—that for all the purposes enumerated gestural expression is in no respect inferior, and in many respects superior to oral, verbal utterances as a means of communicating ideas.”

## 2. *The Origin of Language.*

There are three Deaf-Mutes Schools in Bengal—at Dacca, Barisal and Calcutta. In all these schools the teachers have discouraged the growth of the sign language, which in spite of this official disapproval, has grown and flourished. These, therefore, are to be regarded as independent local growths, in as much as they cannot be traced to a common source. Growths of each of these sign languages have probably been entirely independent of the others. It is commonly argued by anthropologists that similar root-sounds in different languages are evidences of the existence of some parent stock to which they owe their origin. Since these three gesture languages have, to the best of our knowledge, been independently evolved, we shall expect to find no similarity between them. As a matter of fact, we find no similarity at all in the case of some of the words: thus there are three different

signs for Memsahib, Afternoon, Yesterday, To-day, Old Woman, Good. On the other hand all three schools use the same sign for Bad, Girl, Flower, Fat, Horse. Dacca and Barisal use the same symbol for Low, Old Man, Play, while Calcutta has a different sign. Dacca and Calcutta use almost the same sign for Rain, while Barisal has a different sign. The anthropologist may argue that these languages necessarily possess a common origin. It is equally a good supposition that men tend to think and act in the same way, under similar conditions.

### 3. *Present Attitude.*

This sign language, however, is very little used now-a-days, as a means for the education of the deaf, though it used to be employed to a great extent during the early years when it was first introduced, namely, in the 18th and 19th centuries. The grounds on which use of the sign-language has been discouraged in the Deaf and Dumb schools are :

(a) That it is easier and quicker than oral speech or the finger alphabet and acts a substitute for these. It prevents children from learning methods of communication useful in their intercourse with their normal fellow beings and in educating themselves by means of reading.

(b) Gesture languages are intelligible only in the schools of origin.

### 4. *Experiments at Dacca, Barisal and Calcutta.*

The children studied in connection with these investigations possessed some degree of normal speech ; this was convenient for the investigation. There were other children, however who had no power of normal speech. They were seen to converse with one another in the gesture language (recorded below). A test made on these children with the help of pictures showed that their vocabulary was the same as that of

the other children. The small number of words in this vocabulary may probably be due to the fact that the children were younger in age.

The method of investigation was as follows :—

A word was written ; one pupil read the word and made the sign symbol. This was noted. In some cases of doubtful meaning a child performed the symbol to another child and the second child indicated the word. Finally, we performed the whole series of symbols thus collected, to another group of children, and the children gave the Bengali word for the idea signified by each action. This served as a check against the possibility that the signs collected on the first occasion might have been explanations rather than correct symbols.

For comparison, we made similar investigations at the Deaf and Dumb schools at Barisal and in Calcutta. In the latter institution, which is the oldest and the largest of the three the children were able to tell a story in the gesture language. At the same time the gesture symbols were simpler in form but far more numerous than in the two other schools. A comparative study of the symbols is given in the appendix.

### 6. *Observations.*

The signs are in some cases representations of the object, *e.g.*, steamer ; in most cases, however, they are symbols, signifying some one aspect or characteristic of the object standing for the whole.

As has happened in the case of the pictorial Chinese alphabet, the symbols have tended to extend their meaning, especially through analogy to such an extent that the connexion between the idea and its symbol has become obscure.

It will be noticed that the division of ideas into signs is not the same as the division into words. Thus a story in sign language runs thus :

Sign 1—Two-men.

2—Lived-in-a-house.

3—On-the-river-side.

4—By-catching-fish.

5—They-lived.

6—One-man.

7—Went-to-catch-fish.

8—Crocodile.

9—Seized-in-his-mouth.

10—The-man's-leg.

11—He-called-for-help.

12—The-other-man-ran-to him.

13—Seized-upper-jaw-with-his-hands-and-pressed-  
lower-jaw-with-his-foot.

14—And-pulled-his-friend-out.

### *Gesture Language and Behaviourism.*

All thought, according to the Behaviourist, involves some action of the language mechanism. When we read or think, sometimes we mutter aloud : but even if we do not mutter aloud we mutter silently or perform minute innervations of the vocal organs.

We have in the Deaf Mutes a class of people who can think but who cannot and do not use their vocal organs to express thought. The question arises :—Do the gestures of Deaf Mutes take the place of the speech schema which accompanies the thought of normal men ?

A definite answer cannot be given ; but some of the facts noted here are significant :

(i) A Calcutta Deaf Mute informed us that the gestures were occasionally present in dreams, but apparently only when the dreamer was talking or being talked to.

(ii) Deaf Mutes are ordinarily poor readers (being hindered by their lack of inner vocal speech); in teaching English reading to Bengali children we have found it desirable to encourage speech in the early stages and to inhibit it only when the speed of reading tends to exceed that of speech.

(iii) Observations of Deaf Mutes at Dacca sitting solitary without occupation shows that their reverie does tend to be accompanied by a gesture schema. [Once a dumb child was asked to think out a story to be told to the other Deaf Mutes. He was made to sit alone in a room for a few minutes and was carefully observed unnoticed from the outside and it was found that he made some gestures as he was thinking. The story told was about a motor accident in the street.]

(iv) When a story involving brisk action is told to a class of Deaf Mutes by means of pictures and gestures, the children sometimes do tend to use a gesture schema accompanying their thoughts. [This was seen when a dumb child was talking with another in signs about climbing a cocoanut tree within the school compound at Dacca.]

*The Practical Use of Sign Language in the  
teaching of Language.*

The foreign word and its idea should be connected together by a direct bond and not indirectly through another word of the mother-tongue. When we express a thought in a foreign language, the thought should come of itself directly in the words of a foreign language and not first in the words of the mother-tongue and then in the words of the foreign language. The real disadvantage and danger of this indirect bond does not lie in the mere loss of time and facility but in the contamination of child's speech by false bilingual equations which are found when a literal translation of a phrase



in the one language proves to be meaningless or conveys a wrong meaning in the other language, *e.g.*,

- (1) "I go to eat air." } is a literal translation of the Bengali idiom for— { "I go out for a walk."  
 (2) "He was going to beat him." } " { "He was about to beat him."

Incorrect English :

- "Rubbing my eyes I looked through the window and saw that he has lost his consciousness." } " { "I rubbed my eyes, looked out of the window and saw that he lost consciousness."

By means of such sign languages it is possible to give rise to ideas in the child's mind without bringing in any other language, that is, without expressing the thought first in Bengali and then asking the students to translate it into English. Thus there is the least chance of the child's speech being contaminated by false bilingual equation.

An experiment is being carried on in the Armenitola Government High School, Dacca, to discover how far this theory can be applied in practice to the teaching of a foreign language to young beginners, and what type of sign language, whether one of picturegrams or of gestures or mixed, is most effective.

## APPENDIX I.

SIGNS COLLECTED AT THE DACCA DEAF AND DUMB SCHOOL.

<i>Meaning.</i>		<i>Gestures.</i>
1.	Kesab (a boy in School—thin).	Forefinger shaken to and fro.
2.	Book ...	Both wrists to chest, fingers slopping outward.
3.	Fetch ...	Right hand drawn inward, fingers pointing down.
4.	Cow ...	Finger and thumb pressed together, hand raised and drawn downwards, first right hand, then left.
5.	Goat ...	A 'Pronam' (Palms together, hands raised to forehead); then hands palms together, brought sharply down.
6.	Cat ...	Hands about six inches apart (as indicating length); sign of eating rice; gesture towards kitchen.
7.	Thurst ...	Raise chin and stroke neck.
8.	Steamer ...	Hands rotated round each other, then hand sideways to mouth and blow.
9.	Railway train ...	Snatching movements in the air, then right arm rotated like a piston.
10.	Good ...	Stroke arm.
11.	Bad ...	Gesture of thrusting away fingers thrown out.
12.	Girl ...	Finger and thumb to the septum of the nose.

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| 13. | Flower        | ... | Sign of holding a small object and raising it to the nose.                              |
| 14. | Yesterday     | ... | One finger raised, then hand flung back over the head.                                  |
| 15. | To-morrow     | ... | One finger raised, then point forward.  |
| 16. | To-day        | ... | Index finger pointing down and tapping table.   |
| 17. | Morning       | ... | Fore finger and thumb to right eye : then hands in front of face, eyes half closed.     |
| 18. | Noon          | ... | Hands in front of face, about 18 inches distant, then point above head.                 |
| 19. | Afternoon     | ... | Hand level with face, then thrust slowly forward and down.                              |
| 20. | Sahib         | ... | A salute.   |
| 21. | English woman |     | Salute plus a circular movement round the head.   |
| 22. | Old           | ... | Hands together level with chest, body bent forward.                                     |
| 23. | Old man       | ... | Ditto. plus sign for High.  |
| 24. | Old woman     | ... | Ditto. plus sign for Low.   |
| 25. | Fat           | ... | Elbows thrown out.  |
| 26. | Play          | ... | Hands together as in catching, foot thrown out.   |
| 27. | Kerosin       | ... | Wrinkling of nose and gesture of pouring.   |
| 28. | Horse         | ... | Both arms stretched downwards and moved to and fro.                                     |
| 29. | House or room |     | Finger-tips together, hands sloping apart.  |
| 30. | Rain          | ... | Stabbing movement with forefinger, then hand swept sideways with expression of disgust. |

*No symbol discovered for the following :—*

1. Mother ... All gave different symbols except two who put finger to side of nose (a reference to the method of teaching the nasal sound).
2. Father ... All gave different symbol, evidently of a personal nature.
3. Boy ... The symbol for 'short' was used.
4. Babu ... Three different symbols were given by different children corresponding to different connotations of the word (fop, clerk, respectable).

*For the following the children said there was no symbol :—*

1. A crowd of people.
2. Jute.
3. Thunder. (But lightning is an upward zig-zag movement of the hand.)
4. Shop.

The following appear to be homonyms ; or else there is some subtle differences which we failed to perceive.

1. Orange—banana ... Gesture of peeling and eating. (Barisal—the thumb is upwards for banana ; then palm is upwards for orange.)
2. Leaf—fish ... Fore-finger of right hand to wrist of left hand ; left hand moved to and fro.

## APPENDIX II.

SIGNS COLLECTED AT THE BARISAL DEAF AND DUMB SCHOOL.

<i>Meaning</i>	<i>Gestures.</i>
1. Book	... Both the palms together sideways pointing up, hands pressing against the sides of the chest.
2. Fetch	... Right hand drawn inward, fingers pointing down.
3. Cow	... Two forefingers on the two sides of the head. Thumbs pressed against the forefingers (hands closed). Then hands raised and drawn downwards.
4. Goat	... Sign for 'short,' then sign for 'horns.' Both the palms together raised to forehead (for pronam) then down (as is done in sacrifice).
5. Cat	... Hands a few inches apart, sign of eating rice, of anger and then of driving it out (palm outwards).
6. River—Steamer ...	Hands rotated one round the other. Then thumb and forefinger stretched out to mouth and blow.
7. Railway train ...	Right hand half-stretched, fingers apart. Then fingers brought together and raised at the same time twice or thrice. Then right arm rotated like a piston.
8. Good	... Right arm half stretched, fingers touching one another, palm pointing up brought close to the belly twice quickly.

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| 9.  | Bad          | ... | Fingers thrown out twice. Palm outwards.  |
| 10. | Girl         | ... | Sign for 'short'; then middle finger and thumb touching the septum of the nose.   |
| 11. | Flower       | ... | Right hand fingers stretched, moved up and down indicating small bushes then sign of holding an object and bringing it to the nose.                         |
| 12. | To-day       | ... | Right-hand half-stretched, pointing down, fingers touching one another; movement downwards and upwards twice.   |
| 13. | To-morrow    | ... | Forefinger raised up, then moved forward downwards (hand stationary).   |
| 14. | Yesterday    | ... | Fore-finger raised, then turned backwards downwards.  |
| 15. | Two days ago | ... | Two fingers raised, then turned backwards downwards.  |
| 16. | Morning      | ... | Rising from sleep (eyes shut. Right hand palm close to the head, then getting up). Then right hand stretched out; fingers half-thrown out (sign for 'sun.') |
| 17. | Noon         | ... | Bringing the right hand up over the head, fingers pointing down half-thrown out.  |
| 18. | Afternoon    | ... | Hand level with the shoulder with fingers thrown out, then moving it forward and downward.  |
| 19. | Sahib        | ... | Right hand moved round the head and sign of wearing necktie (placing the hand over the lower-end of the throat and bringing it down in a curved way).       |

20. Memsahib ... Sign of white skin—placing the palm of the right hand on the right forehead and cheek and bringing it slowly down ; and touching the middle part of the eye-brows with the fore-finger (sign of woman).
21. Old ... Hands together level with the chest and the body bent forward, and sign of absence of teeth.
22. Old man ... Ditto.
23. Old woman ... Sign for 'old'; and of woman (touching the middle part of the eye-brows by the fore-finger).
24. Fat ... Elbows thrown out.
25. Play ... Sign of a foot-ball and of kicking.

*Note*—Some showed also "hadododo" game.

26. Kerosine ... Sign of pouring and lighting ; and wrinking of nose when the hand is brought close to it.
27. Horse ... Sign of holding the bridle tight—both hands together, first backward and then forward movements twice or thrice and sign of whipping.
28. Home ... Pointing to himself and then moving the hand outwards.
29. House ... Hands in an inclined position, fingers of both hands meeting.
30. Rain ... Stretching the right hand palm up, fingers bent at full length, bending the wrist, making upward and downward movements thrice or four times, fingers together (moving the wrist only and not the hand).

- |            |     |  |
|------------|-----|--|
| 31. Mother |     | Sign of woman and holding the children in the lap (upper part of the arm close to the sides of the chest).   |
| 32. Babu   |     | Sign of moustache and of chain.  |
| 33. Crowd  | ... | Pointing to persons sitting round and then hand from one side to the other indicating 'many.'  |
| 34. Orange | ... | Sign of holding an orange with the left hand, then right hand from it to outwards all round (in order to peel) and then spitting out pips. (Back of hand downwards). |
| 35. Banana | ... | Sign of holding it and of feeling and then of eating. (Thumb upwards, palm edge ways to the ground.)   |
| 36. Leaf   | ... | Hand and arm stretched up and then brought diagonally down gradually moving the fingers.   |
| 37. Fish   | ... | Hand moving forward fingers outstretched and moving to and fro.  |
| 38. Boy    | ... | Sign for 'short' only.   |
| 39. Khata  | ... | Hands six inches apart vertically and horizontally, then sign of turning over.   |
| 40. Night  | ... | Moving the fore-finger sideways.   |
| 41. Boat   | ... | Both the hands on the left side and then sign of rowing.   |

*No symbol discovered for the following :—*

Thirst, Lightening, Shop, Room, (       ), Thunder, Father.

---



### APPENDIX III.

#### SIGNS COLLECTED AT THE CALCUTTA DEAF AND DUMB SCHOOL.

<i>Meaning</i>	<i>Gestures.</i>
1. Come	... Beckon.
2. Eat	... Sign of eating. Rice sign.
3. Book	... Left hand back downwards, right hand thrown to and fro above (rather inwards).
4. Cow	... Two forefingers on the two sides of the head (Horns sign).
5. Bull	... Horns sign and hump sign.
6. Goat	... Sign for small and cut symbol (hands, palms together, brought sharply down).
7. Cat	... One hand above and another below, stroking.
8. Thirst	... Drinking sign and stroke throat.
9. Muhamedan	... Right hand brought under the chin, palm upwards (sign for beard).
10. Hindu (Kayastha)	... Sign for Dhoti.
11. Brahmin	... Sign for sacred thread.
12. Sea-steamer	... Flat sign, then hands up and down.
13. River-steamer	... Hands rotated round each other.
14. Railway train	... Snatching movements in the air, right arm rotated like a piston.
15. Good	... Right hand palm up moved to and fro.
16. Bad	... Gesture of thrusting away fingers thrown out.
17. Girl	... Finger and thumb to the septum of the nose.

18. Flower           ... Sign of holding a small object and raising it to the nose.
19. Marigold       ... Throwing movement with closed fingers (as in worship).
20. Rose           ... Flapping sideways as sprinkling scent and flower sign.
21. Yesterday      ... Fingers round in front of the eye, then sweeping the hand away.
22. To-morrow     ... Fingers in front of the eye ; then hand, fingers out short forward movement.
23. To-day         ... Hand, fingers out, downward movement.
24. Morning        ... Opening of eyes, fingers in front of the eye. Spreading of fingers as eye is opened.
25. Noon           ... Hand above head fingers out.
26. Afternoon     ... Sweeping movement from left down to right (sideways). Always to the *west*.
27. Sahib          ... Sign of taking off the hat.
28. Memsahib      ... Nose sign and breast sign.
29. Hindu-woman... Nose sign and sign for parting of hair.
30. Muhammadan  
      woman       ... Sign for beard and "Borka" sign.  
                      (Sweep from head down) and hands over eyes.
31. Old man        ... Pinch cheeks and single-handed stick (first closed and moved to and fro level with chest).
32. Old woman     ... Pinch cheeks, fingers to the septum of the nose, parting of hair.
33. Fat            ... Elbows out.
34. Play           ... Both the hands flapping up and down (palms up).
35. Kerosine oil   ... Striking match, pouring, smelling hand, nasty smell.
36. Horse          ... Hands moving together as with reins.

- |     |               |   |
|-----|---------------|---|
| 37. | House or Room | Sign of sleeping and fore-fingers moved in a square.          |
| 38. | Home          | ... Hands sloped together.                                    |
| 39. | Tin-shed      | ... Post-sign (with both fore-fingers up) tin-sign.           |
| 40. | Rain          | ... Stabbing with finger downwards.                           |
| 41. | Mother        | ... Hand down from head over face (veil) fingers to nose.     |
| 42. | Father        | ... One hand, finger and thumb over the lip showing moustace. |
| 43. | Boy           | ... Short-sign.   |
| 44. | Babu          | ... Curling moustache (on one side).                          |
| 45. | Crowd         | ... Fists closed, elbows close to body and sway.              |
| 46. | Lightning     | ... Zigzag movement of the hand forward and downward.         |
| 47. | Orange        | ... Round sign. Squeeze and eye wink.                         |
| 48. | Banana        | ... Peel the right thumb.                                     |
| 49. | Leaf          | ... Hand, fingers slightly stretched shaken sideways.         |
| 50. | Fish          | ... Slow flapping from wrist.                                 |

*The following signs were not in general use :—*

- |    |         |   |
|----|---------|---|
| 1. | Jute    | ... Rub hands and pull apart.   |
| 2. | Thunder | ... Lightning sign and hands spread and shaken.   |
| 3. | Shop    | ... Give and take (hands palm up moved in and out). Pay (holding coin in finger and thumb). |

*A.—Signs common to Dacca and Barisal.*

- |    |  |       |
|----|--|-------|
| 1. | Both wrists to chest, fingers sloping outward. | Book. |
|----|--|-------|

- |   |   |
|---|---|
| 2. Right hand drawn inwards, fingers pointing down.   | Fetch (The normal 'beckoning' sign in Bengali). Cow |
| 3. Finger and thumb pressed together, hand raised and drawn downwards, first right hand, then left. | (the symbol refers to milking).                     |
| 4. Hands together level with chest, body bent forward.  | Old. (Lean on a stick.)                             |
| 5. Ditto <i>plus</i> sign for High.   | Old man.  |
| 6. Hands together as in catching, foot thrown out.  | Play. (Catch-kick.)                                 |
| 7. Finger-tips together, hands sloping apart.   | House or room.                                      |
| 8. Both the hands on the left side and then sign of rowing.   | Boat.   |

*B.—Signs common to Dacca and Calcutta.*

- |   |   |
|---|---|
| 1. Snatching movements in the air, then right arm rotated like a piston.  | Railway train. (Puff-puff piston).          |
| 2. Raise chin and stroke neck.  | Thirst. (Calcutta adds symbol of drinking.) |
| 3. Fore-finger and thumb to right eye : then hands, palms inwards about six inches from the face, eyes half closed. | Morning (wake—see with difficulty).         |
| 4. Stabbing movement with fore-finger, then hand swept sideways with expression of disgust.                         | Rain (Calcutta stabbing movement only).     |

*C.—Signs common to Barisal and Calcutta.*

- |  |                                     |
|--|-------------------------------------|
| 1. Hands in front of face, about 18 inches distant, then point above head. | Noon (see easily : sun above head). |
|--|-------------------------------------|

2. Hand, palm upwards at the base of the breast bone and moved to and fro. Good.

*D.—Signs common to Dacca, Barisal and Calcutta.*

1. Gesture of thrusting away, fingers thrown out. Bad.
2. Finger and thumb to the septum of the nose. Girl (because of the nose ornament).
3. Sign of holding a small object and raising it to the nose. Flower. (But the yellow marigold used in worship has a special gesture name.)
4. Elbows thrown out. Fat (or strong).
5. Wrinkling of nose and gesture of pouring. Kerosine.
6. Both arms stretched downwards and moved to and fro. Horse.
7. The symbol for 'short.' Boy.

*With slight differences.*

8. A 'Pronam' (The Hindu equivalent of salaam—palms together, hands raised to forehead) : then hands, palms together, brought sharply down. Goat (Pronam to the goddess, then cut off head).
  9. Hands rotated round each other, then hand sideways to mouth and blow. Steamer. (Paddle-puff.)
-

## Influence of Sensory Stimulus upon Muscular Work

S. SINHA AND M. GHOSH.

Féré in his well-known work on *Sensation and Movement*, states that the Dynamogram of the individual increases to the extent of 16 to 20 per cent. when there is an intellectual stimulation. He demonstrates experimentally that sensory processes, like intellectual operations, lead to an increase in the output of muscular works.<sup>1</sup> Thus the Dynamometric index for the right hand is increased by various coloured stimuli from 23 to 42 by red, 35 by orange, 30 by yellow, 28 by green and 24 kilos by blue. Plethysmographic curve demonstrates the same type of augmentation.<sup>2</sup> Tonal impressions, too, conducted through ears and through bones markedly raise the muscular ability. In the same manner the muscular ability is increased from 23 to 28 by sugar, 35 by salt, and 39 kilos by quinine-sulphate.<sup>3</sup> Féré explains this phenomenon by what he calls "Psycho-Motor Induction."

James and others following Féré's lead have accepted these results without further experiments.<sup>4</sup> Bergson has likewise drawn important conclusions in regard to Psycho-Physical processes upon the basis of Féré's experiments.<sup>5</sup> This increase in the output of muscular work which results from the application of sensory stimuli has generally been known as the 'Dynamogenic Effect of Sensations.'

The experiments reported in this paper were undertaken with a view to test the validity of Féré's results. In the

<sup>1</sup> *Sensation et mouvement*, p. 45.

<sup>2</sup> *Op. Cit.*, p. 41.

<sup>3</sup> *Op. Cit.*, p. 49.

<sup>4</sup> James—Chapter on Production of Movement.

<sup>5</sup> Bergson—'Time and Free-will.'

course of our experiment on the phenomenon of distraction it appeared that the kind of increase in muscular capacity which Féré suggests, might not after all have been a fact. A series of systematic investigation was consequently undertaken in order to clear up the issue.

*Methods and Materials.*—

The methods that we pursued were the following:—

(1) A normal record of performance of the individual subject was taken after due practice. A similar curve was then taken after particular type of sensory stimulus was applied for a specific period of 15 to 20 seconds.

(2) The subject was given a particular motor task and a sensory stimulus was applied after the work curve showed downward course.

The following appliances were employed :—

- (1) Mosso's Ergograph.
- (2) Cattell's Finger Dynamometer.
- (3) Dynamometer.

The following stimuli were applied :—

(a) Visual :

- |           |             |
|-----------|-------------|
| (1) Red.  | (2) Green.  |
| (3) Blue. | (4) Yellow. |

(b) Olfactory :

- |                |                    |
|----------------|--------------------|
| (1) Terebinth. | (2) Aguru.         |
| (3) Iodoform.  | (4) Amyle Acetate. |

(c) Auditory :

- (1) Tuning Fork 'C'
- (2) Harmonium 'G' & 'D.'
- (3) Flute Harmonium.

Four subjects, trained in laboratory method, participated in this experiment.

The work was carried on from 23rd November, 1926 to 3rd March, 1927.





TABLE II.

Instrument—Cattle's Finger Dynamometer.

Stimulus—Visual.

Exp.	Series No. 1.		Series No. 2		Total.	
Subj.	Loss	Gain	Loss	Gain	Loss	Gain
A						
B	0	0	5.9%		5.9%	
C	0.3%			0.2%	0.3%	0.2%
D	1.29%			3.5%	1.29%	3.5%

TABLE III.

Instrument—Mosso's Ergograph.

Stimulus—Olfactory.

Exp.	Series No. 1.		Series No. 2.		Series No. 3.		Total.	
Subj.	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
A		1.50%	2.45%		9.1%		16.8%	1.50%
B	2.98%		5.10%		9.1%		30.0%	
C	2.62%						2.62%	
D	4.8%		5.1%				5.1%	4.8%

TABLE IV.

Instrument—Cattle's Finger Dynamometer.

Stimulus—Olfactory.

Exp.	Series No. 1.		Series No. 2.		Series No. 3.		Series No. 4.		Total.	
Subj.	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
A	...	5.4%	...	...	1.8%	...	...	...	5.4%	1.8%
B	...	5.5%	...	8.0%	...	...	...	...	6.8%	...
C	...	...	...	4.4%	...	20.0%	...	1.72%	13.9%	...
D	...	10.0%	...	13.0%	...	...	...	...	11.5%	...

TABLE V.

Instrument—Dynamometer.

Stimulus—Olfactory.

Exp.	Series No. 1.		Series No. 2.		Series No. 3.		Total.	
Subj.	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
A	...	0.3%	...	2.4%	...	1.2%	1.3%	...
B	...	...	2.9%	6.1%	...	...	6.1%	2.9%
C	...	...	...	...	...	...	...	...
D	...	8.8%	...	...	...	...	8.8%	...

[illegible]

*Conclusion.*

Ref. Table III.  
Subj. A.

An inspection of the tables would at once show that the cases of increase in the output of work are very few. An individual who showed an increase of 15% in one series showed a decrease of 24% and 9% in two other series. Thus we are forced to the conclusion that the sensory stimulus affects the muscular work as a distraction. There is a rival sensory adjustment which leads to a relaxation of the muscular preparation necessary for the continuance of the work.

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## Blind-Fold Description of Distance

M. N. BANERJEE.

It is a well-known fact that we miscalculate the distance and direction of objects when we try to approach them with our eyes closed. The paper embodies the result of a series of experiments, devised with a view to determine the amount of error involved in such instances.

*Method.*—Subjects in these experiments were required to walk blind-folded from a given starting point to fixed goals standing at various distances. The work was carried on in a courtyard measuring 2000 sq. feet ( $50 \times 40$  ft.). It was found that even the slightest sound often helped the subject to find his orientation. Hence, all conversation and other sounds were stopped so far as practicable. Familiarity with the ground obviously helps the subject to estimate distances and directions with a large degree of accuracy. Thus, the ideal ground would be one which is equally unfamiliar to all. Since this condition could not be fulfilled, the experiments were conducted in a place which was, to all appearances, equally familiar to all.

A line marked by chalk connected the starting point with the goal which was a small inverted jug. The subject was made to stand at the starting point and asked to look at the object which he was told would be removed as soon as he was blind-folded. When the eyes of the subject had been effectively covered with cotton-wool, he was asked to proceed to the goal as previously seen. The subject was further instructed to retrace his path from the goal to the starting point. A double set of readings was, thus, obtained. The distance between the goal and the spot at which the subject stopped was calculated; the deviations of the subject to the right and the left

of the line marking the path, were also recorded. An attempt was made to estimate the angles of deviation in some cases; but the procedure had to be abandoned.

The *Observation* of the conduct of the subjects brought out certain interesting phenomena—(1) The subject very rarely reaches his final stopping place in a single line, straight or curved; the changes of direction in the track are many. (2) It is seldom that the path is described without three or four halts showing subjective doubt in regard to the accuracy of the path and to the location of the goal. (3) The deflection of the angle between the mesial vertical plane of the head and that passing through the extremities of the collar bone and the tips of the *Illium*, from the normal, at start is often indicative of the deviation from the true track when blindfolded. It was for this reason that the position of the head was adjusted by the experimenter or his agent at the start. But curiously enough there were in many cases a change in the position of the head, unconsciously followed by a deviation from the right course. (4) In many cases there was a tendency to correct the deviation from the goal at the last stage. The place which the subject reached after this correction served as the basis of calculations. Its distance from the goal and its location to the right or left were taken into account in estimating the 'errors.' Since these are the combined products of a series of errors at each phase of the journey, they are termed 'ultimate' errors. (5) A number of subjects were tested in regard to the effect of rotation, clockwise or counter clockwise. The errors showed a large degree of variability and the subjects lost the tendency of correcting the deviation.

The subjects were all Bengalees. They were divided into 4 Age groups. A (6 to 9)—5; B (10 to 13)—13; C (14 to 17)—10; D (19 to 26)—12, making a total of 40. The table A given below shows the average of each of the groups and the total for the distances 10, 25 and 50 feet at the 1st and 2nd trial.

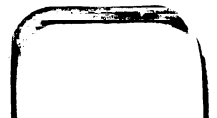


TABLE A.

Group		Distance X 10		Distance Y 25		Distance Z 50	
		1st trial.	2nd trial.	1st trial.	2nd trial.	1st trial.	2nd trial.
A 6-9 N 5							
Total	...	13.1	4.9	26	17.8	70.5	28.9
Average	...	2.62	.98	5.2	3.56	14.1	5.8
B 10-13 N 13							
Total	...	10.5	8.85	59.8	34	156.2	87.5
Average	...	.8	.68	4.6	2.6	12.0	6.7
C 14-17 N 10							
Total	...	20.6	13.01	37.04	31.5	111.1	65
Average	...	2.06	1.30	3.70	3.15	11.1	6.5
D 19-26 N 12							
Total	...	26.85	28.5	35.1	21.6	99.4	61
Average	...	2.23	2.3	2.9	1.8	8.28	5.0
Total 6-26 N 40							
Total	...	71.05	55.26	157.94	104.9	437.2	242.4
Average	...	1.77	1.38	3.94	2.62	10.98	6.06

The table B gives the character of deviation, to the right or to the left; it also represents the facts of overestimation and underestimation.

TABLE B.

*The deviations, overestimation and underestimation.*

Group		Deviation to the Right.	Deviation to the Left.	Overestimation	Underestimation
A	...	40	86.6	0	60
B	...	30.76	71.79	7.69	69.21
C	...	40	56.6	33.3	68.3
D	...	33.8	61.1	33.8	41.6
Total	...	3.5	66.6	20.63	58.3

The percentage should be halved for absolute comparison.

It will be noticed that deviations to the right and to the left occurred in 42 and 80 cases respectively out of 240 trials. Thus of the 50 per cent. of the cases, the deviations were in 17·5 per cent. towards the right and in 33·3 per cent. towards the left.

TABLE C.

*The influence of distances upon deviations.*

Deviation	10 ft.	25 ft.	50 ft.
Right	6'25%	15 %	31'25%
Left	10%	37'5%	52%

The largest amount of deviation is towards left for all the distances. The fact of overestimation and underestimation of distances (Table B) shows some interesting features. Out of 240 trials, in 70 cases the subjects stopped short of distances while in 2·5 cases they went beyond the goal. The cases of underestimation are three times as frequent as the cases of overestimation.

TABLE D.

*Influence of distance upon overestimation and underestimation.*

Distances	10 ft.	25 ft.	50 ft.
Overdone	17'5	11'5	2'5
Underdone	10	32'5	25

The table shows that the tendency of overestimation diminishes with distance while that for underestimation remains fairly constant.

*Conclusions.*—

1. A remarkable improvement occurs at the second attempt in blindfold description of distances.



2. The error deviation is greater for longer distances and seems to be independent of the initial angle of deviation.

3. The increase in age tends to decrease the amount of the error of deviation and its frequency.

4. In nearly 50 per cent. of trials there was a directional deviation either to the right or to the left. There were twice as many deviations to the left as there were to the right. The tendencies for directional deviation increase with age.

5. In about 40 per cent. of trials the distances were either overestimated or underestimated. The frequency of underestimation was three times that for overestimation. The tendency to overestimation is not much influenced by age, while the tendency to underestimation decreases in the case of higher age-groups. The distance factor clearly tells on the tendency to overestimate but has little influence on the tendency to underestimate which generally gains the upper hand.

6. There is an unconscious tendency to correct the deviation from the right course.

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### Notes and Abstracts

Psychological Review, November, 1927, Vol. 34 ; No. 6

*The So-called ' General character Test' :*

*Paul A. Witty and Harvey C. Lehman.*

Tests of General character, whatever the term may connote, are becoming as common as those of General Intelligence. May and Hartshorne have published two comprehensive bibliographies (Ped. Sem. 1925, 32. and Psych. Bull., 1926, 23.) of tests that directly apply to General character. The paper surveys the scope of character testing and its pitfalls. Very few investigators have recognised the fact that character is neither a unitary trait nor a combination of unitary traits. Moreover, each of the constituent-traits measured by tests, seem to be analysable. Thus, Symonds ('The Present status of character measurement.' Jl. of Educ. Psych. 1924, 15, pp. 484-498) remarks that "thrift seems to be a bundle of more or less loosely connected special habits, habits with regard to and conservation of materials, earning, saving, spending and repairing." The honesty-test, likewise, shows that in the classroom under academic influence, children behave in a particular way. The use of these data for a wider generalisation or the predication of behaviour, is unwarranted.

*A Mental unit of Measurement : L. L. Thurston.*

Mental measurement presupposes a psychological continuum which can be contrasted with the stimulus-continuum. The former was defined as a sensation-continuum by Fechner and as a continuum of sense-distances by others. The paper presents an interpretation of the sense-distance hypothesis which avoids many of the usual difficulties. The stimulus

may vary in quantity or quality ; the theory does not rest upon an assumption homogeneity of the stimulus. Nor is there any assumption of divisibility of the psychic states or of one state being in any respect a multiple of another. The author points out that any point on the psychic scale represents a unified and indivisible experience. Any two points represent two such experiences so that the distance between them could not be measured in terms of psychic attributes.

How then can the psychic states be measured? They acquire conceptual linearity and measurability in the probability with which each of them may be expected to associate with any prescribed stimulus. The psychic or continuum is defined in such a manner that the distribution of S-experiences for any given stimulus R is normal. Each modal S experience is that particular S-experience which is most frequently associated with the stimulus R. Hence if measurement begin with the stimulus R for which S is the most common or modal experience, then some other S-Experience, s, will be spaced far away, along the imaginary C continuum, if the probability is low that will be experienced with the stimulus R. "If the probability be high, S will be spaced close to R. The psychological scale is, thus, a frequency scale. But since the psychic scale is not directly controllable, we identify any point on the scale by a stimulus magnitude. Mental measurement depends according to this interpretation on the frequency with which each of the processes constitutes the response to a given stimulus. The natural psychological unit of measurement is the standard deviation of the frequency distribution for a specified stimulus. This unit is called by the author the *Standard discriminial error* for the specified stimulus.

*Three psycho-physical laws: L. L. Thurston.*

The paper compares Weber's law, Fechner's law and Thurston's law of comparative Judgment. Weber's law states that the ratio between two stimuli which are correctly

discriminated in any specified proportion of the attempts is a constant. Fechner's law on the other hand says nothing about the proportion of correct discriminatory judgments. It states the relation of the stimulus interval to the apparent sense interval. The law of comparative judgment on the other hand states the discriminial dispersion or the relative ambiguity with which each stimulus is perceived or responded to.

*A Behaviouristic definition of consciousness: E. C Tolman.*

This paper, according to Dr. Tolman, should have been called "The frantic attempt of a behaviourist to define consciousness." A rat has been responding to two objects, black and white in the same manner. An occasion arises when each of these has to be acted upon in a particular way. Thus, the behaviour, hitherto undifferentiated with respect to these objects, becomes differentiated. It is in such cases that we may presume consciousness. In Dr. Tolman's words "whenver an organism, at a given moment of stimulation, shifts then and there, from being ready to respond in some relatively less differentiated way to being ready to respond in some relatively more differentiated way, there is consciousness." In other words consciousness is a function of discriminative or specialised action. But the author goes further. Organisms, at least the higher ones, are capable not only of behaviour but also of what is termed behaviour adjustment. This term signifies an operation by which the organism may be brought into relation with the stimulus-situation without actual physical action. Thus, there is a representation of behaviour without an overt performance. That such a process is not repugnant to behaviourism is indicated by Watson's use of *sub-vocal* speech for the same purpose. Further more, the discriminative function and representation may take place through associative extension. Thus Dr. Tolman's behaviourism is elastic enough to accommodate a discriminative, representative and associative consciousness.

*The constancy of sex differences in mental traits at various ages :*  
*F. L. Goodenough.*

The paper gives a resume of the data of the various experimental studies on this point and presents a set of conclusions that can reasonably be drawn. The principal ones are :

(1) Mental differences between the sexes are very small in comparison with the amount of variation between members of the same sex. These differences may safely be ignored so far as educational procedure is concerned.

(2) Nevertheless sex, differences in a measurable degree do exist. (3) The pattern of abilities which tends to characterize either of the sexes, remains relatively constant from childhood to maturity. The paper is accompanied by an extensive bibliography.

N. N. SEN GUPTA.

**The Journal of Applied Psychology : June, 1927.**

*A New Method of Weighting and Scaling Mental Tests :*  
*F. Khulmann.*

In 'weighting' and 'scaling' mental tests the usual practice has been to determine the average total score that children at each age make on the 'battery of tests.' In such a procedure each test or item counts for the same as every other item. But the proper method should be one, as many writers have urged, in which the value of each test is taken into account in proportion to its share in determining mental development. The writer of this article suggests a method which is calculated to satisfy this requirement. This method establishes an 'age norm' for each trial in each test. That is, it determines "the average age of children that pass just one trial, just two trials, etc., of each test," and not the average total score that children at each age make. The several steps

or forms in the method can thus be outlined. First, each test of the Binet scale is carefully suited to a given age by scoring a child on each test as passed or non-passed. Secondly, the 'age norms' are obtained by determining for each age the total number of trials or items in the tests. Thirdly, the 'raw scores' are weighted on the basis of the standard duration, using Rugg's Table V to get the sigma scores. Lastly, these sigma scores are multiplied by  $r$ , when  $r$  stands for "correlations between a series of scores on each individual test in a battery with the series of the total scores for all the tests in that battery."

The following are some of the chief merits of this method claimed by the writer :—

(1) Exact showing of the range of applicability and discriminative capacity of each test is made possible by the determination of age-norms.

(2) Sources of unreliability characteristic of group-test results, such as influences of zero or maximum scores and chances for underweighting and overweighting, are greatly diminished.

(3) The present scale is suitable for both group-testing and individual examination.

*Predicting Abilities from Interests : Dougal Freyer.*

The writer undertook to investigate how far actual data would corroborate the popular belief that interest was predictive of ability. Thorndike had found a positive correlation between interest and abilities, but his findings came into conflict with the experience of 'personal' executives. By observation and experiments with a large number of young people of both sexes the writer comes to the conclusion that in the field of education as well as in that of vocation, there is no significant relationship between interest and ability.

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*The Role of Personality Traits in Selecting a Career :*  
*R. H. Elwood.*

Experiments conducted in a nurses' Training School revealed that students of that institution were more markedly extrovert than college girls of the same age. Some of the traits noted in the nurses were : Nurses give less attention to personal appearance than college girls ; they are less moody ; they blush less ; they are less inclined to day-dream ; they are less radical in their political or religious views ; they prefer working with others.

It was founded that a negative correlation subsisted between scholarship and extroversion, the most extrovert girl being the least successful in mastering class lessons.

*The Journal of Applied Psychology, August, 1927.*

*The Intelligence of Mixed Blood Indians : T. R. Garth.*

A positive correlation of .51 has been found between the degrees of " white-blood " and scores in intelligence-tests. The writer has applied a set of modified tests to the mixed-blood Indians of various American States. He obtains a correlation of .42, and remarks that such a low co-efficient cannot be a sure index of the influence of the degree of white-blood. From his study of the variability of I. Q. in both Whites and full-blood Indians he concludes, " intelligence as measured is not peculiar to any special race but is a variable factor in all races."

*Truancy and Delinquency : H. D. Williams.*

Truancy is not to be considered as a mere question of absence from schools for seeking out-door enjoyment. The writer points out various sources of danger to which a truant of a modern city is exposed. Wandering around the city streets the truant boy comes under the influence of undesirable persons and develops various anti-social habits.

The writer condemns the practice of bringing truants before a law court. "Truancy is really a school problem and should be handled by school authorities." As soon as the first symptoms of truancy appear the causes should be carefully ascertained. The following are the factors which generally give rise to truancy : (1) Defective home conditions, (2) Defective physical conditions, (3) Mental abnormalities, (4) Defective or unsatisfied interest due to a restricted course of study, (5) Undesirable companions.

The remedy lies in ameliorating the conditions at home, and in the school. At the same time, the bodily and mental conditions of the boy should be seriously taken account of.

*Change of Environment and the I. Q. : F. M. Teagarden.*

The article presents the study of two girls under different conditions of environment. The I. Q. of the two girls was determined before they were removed from their unhealthy home environment and were sent to an up-to-date and well managed institution. After five years they were again tested with a view to discover the effect that the change of environment had made upon their I. Q. It was found that the quality intelligence had remained almost unchanged, though moral, physical and domestic habits showed vast improvements.

*The Thorndike Intelligence Tests and Academic grades :  
D. Graver & W. T. Root.*

The cases of 569 students of the Pittsburgh University were studied with a view to discover whether their academic standing in the college course conformed to their ranking by the Thorndike Intelligence Tests. A correlation of about .39 was found. The writer argues from this [that exclusion of students from college on the basis of the Thorndike



Examination alone, is not justifiable. He also found that high or low score in Thorndike Tests do not necessarily imply high or low attainment in scholarship.

S. K. BOSE.

**Journal of Experimental Psychology, Vol. X, No. 6,  
December, 1927.**

*The Cutaneous Perception of Softness and Hardness :  
Alice. H. Sullivan*

The results of Sullivan's Experiments on the cutaneous perception of softness and hardness show that optimal hardness depends upon "(1) pressure of the same intensity throughout the area stimulated; (2) a well-defined boundary line; (3) coldness," and that optimal softness is conditioned by "(1) pressure of varying intensities throughout the area stimulated; (2) an indefinite boundary line; (3) warmth." Zigler's conclusion that softness "lacks a definite peripheral contour" is supported by Sullivan's experiments but Sullivan does not find that movement is an indispensable condition as was suggested by Katz. As cutaneous phenomena generally receive less attention from the psychologists than other sense departments the more such experiments are conducted on this important sense-organ, the better it would be for our understanding of some of the fundamental problems of perception.

*Types of Dextrality among North American Indians :  
June. E. Downey.*

Downey accepts the suggestion recently made by Rife regarding the classification of 'Dextrality types' and applies his formulæ in comparing the types of dextrality among N. Americans with those of whites. He gives several tables,

separate ones for males and females, from which marked difference in some cases can be noticed. But the results are tentative, as the groups examined were small and not homogeneous.

*The dependance of learning and recall upon prior intellectual activity : Paul. A. Whitely.*

The experiment consisted in giving to the subject an intellectual task just before memorising a series of words and noting whether the arousal of the apperceptive system needed for the intellectual task facilitated or retarded the subsequent learning and recall. The result showed that while it was ineffective in influencing learning it acted detrimentally on recall, especially when the apperceptive disposition aroused was closely related to the material memorised.

Elmer Culler continues his studies in the Psychometric Theory and in this issue he discusses the probable Error of the Limen (Method of Constant Stimuli).

S. C. MITRA.

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